

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Dynamically Generated Gap from Holography: Mottness from a Black Hole¹ KA-WAI LO, MOHAMMAD EDALATI, ROBERT LEIGH, PHILIP PHILLIPS, university of illinois — In the fermionic sector of top-down approaches to holographic systems, one generically finds that the fermions are coupled to gravity and gauge fields in a variety of ways, beyond minimal coupling. In this paper, we take one such interaction – a Pauli, or magnetic dipole, interaction – and study its effects on fermion correlators. We find that this interaction modifies the fermion spectral density in a remarkable way. As we change the strength of the interaction, we find that spectral weight is transferred between bands, and beyond a critical value, a hard gap emerges in the fermion density of states. A possible interpretation of this bulk interaction then is that it drives the dynamical formation of a (Mott) gap, in the absence of any symmetry breaking.

¹NSF DMR-0940992

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Date submitted: 19 Nov 2010

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